ASSAP MOPS Telecon Minutes #2

The ASSAP MOPS telecon, on 27 July 2006, started at 2:00 PM (Eastern Time). Roxaneh presented an overview of ASSAP (file: ASSAS Strawman Functional Architecture_July27.ppt).

The attendees included the following:

Last Name	First Name	Organization
Bachman	Larry	APL
Branch	Allen	FAA
Brandao	Ruy	Honeywell
Chamlou	Roxaneh	MITRE/CAASD
Conway	Sheila	NASA
Doerr	Jay	ACSS
Eich	Tom	ACSS
Mosher	Tom	Garmin
Samanant	Paul	Honeywell
Sleightt	Randy	APL
Thomas	David	L-3 Titan
Walker	Don	Honeywell

1. Roxaneh stated that the presentation material is a strawman functional architecture to serve as a starting point for the ASSAP requirements discussion. It provides the justification for the proposed architecture (source-level tracking, inter-source correlation, best-source selection) and discusses potential functions that could be performed. Not all of the proposed functions are likely to be in the final version and other functions may be added.

2. There was a question during the presentation regarding what cross-referencing of traffic means. Cross-referencing is a method of identifying when the same A/V is received from multiple sources (i.e., ADS-B, TIS-B, TCAS)

3. Page 9 of the presentation shows multiple types of tracks provided to the applications. It was clarified that only one track (best track) per aircraft will be passed to the applications. The diagram shows 7 possibilities of tracks based on possible cross-references and best track selections.

4. The proposed ASSAP architecture does not fuse position or quality information from multiple sources from the same aircraft.

5. The proposed ASSAP architecture uses a Source Level Tracker with Best Track Selection for ADS-B and TIS-B sources.

6. The In-Service Status was shown in the presentation as a possible indication to the CDTI that the aircraft is not in a service area.

7. A discussion took place questioning whether ASSAP must handle the case when two or more aircraft have the same address. During the last group meeting, it was agreed that ASSAP will assume in its design that all addresses are unique for 1090ES until this issue is resolved. Roxaneh's presentation assumes that relying on addresses alone is not sufficient (for UAT and potentially for TIS-B) and includes a method of sorting out duplicate addresses via spatial filters. The aircraft that falls outside of the spatial window would be considered another aircraft. This method would mitigate duplicate UAT targets (where all the data is included in a single squitter message). This method would not work for 1090ES reports because the ADS-B/TIS-B data is transmitted in more than one squitter. The data in the reports may contain messages from both aircraft. DO-260A assumes unique addresses and does not address this issue. Ruy will provide a safety analysis regarding duplicate addresses. The related action item, AI# 24, already exists from a previous group meeting (see group meeting #2 minutes).

8. The group recommended that more than one report may be required before initiating a track.

9. Tom Mosher stated that ASSAP cannot assume that all the ADS-B reports are filtered/tracked prior to ASSAP reception. Roxaneh was of the opinion that the state vector information in both TIS-B and ADS-B is pre-tracked/filtered (i.e., TIS-B via the Ground Surveillance Processor does not send radar measurements but tracked state vector, and GPS receiver /FMS includes a tracker.) Thus, the degenerate Kalman she had proposed would update a track by accepting the report's position/velocity (i.e., w/o further processing) rather than update a track as a classic Kalman filter would with a pure measurement (i.e., compute a Kalman gain to derive a weighted combination of the received measurement and the tracker's predicted state at the time of the measurement). The degenerate Kalman filter provides a means for predicting the position/velocity and the associated uncertainty to meet ASA MASPS extrapolation requirement (see item 15). It was recommended that the track filter not be a requirement but possibly MOPS guidance. The requirements should be performance based and testable.

10. **Action Item (Larry Bachman):** An action was taken to define the performance requirements for tracking.

11. It was recommended that ASSAP not include the term "background processing" since it implies design. "Continuous processing" may be a better term.

12. It was recommended that the splitting track function not be a requirement in the MOPS. The requirement should be performance based to split tracks with duplicate address for example.

13. **Action Item (Roxaneh):** Remove the following requirement in the presentation, "The new track ID be set to the report ID". This is a design requirement that should be left up to the manufacturer.

14. It was recommended that the track merge logic for dual TIS-B tracks is not a requirement but may be a recommended method. There was some discussion if it would be better to show both tracks on the display.

15. The ASA MASPS (R3.186) requires that position and quality be extrapolated to a common time within one second. (ASSAP **shall** (R3.188) deliver track reports to the CDTI for all aircraft of sufficient quality for at least enhanced visual acquisition, extrapolated to a common time that is within 1 second of the time the data is delivered to the CDTI, with at least a 1 Hz rate.) Extrapolation of quality data was questioned if necessary and if the quality should be static from the reports. ADS-B data is transmitted regularly in short intervals (less than 1 second) and may only need to be extrapolated when the track is coasted. TIS-B tracks may be an issue because they may not be updated up to 12 seconds and the quality data would be extrapolated beyond their display threshold between every report. Comment (unknown source, Ruy/Don?): If this is the case, then the track should not have been displayed in the first place.

16. **Action Item (not yet assigned)**: Examine the intent of the the ASA MASP requirement for extrapolation of track quality.

17. Only half of the presentation was completed. Roxaneh will schedule another telecon (1 hour) August 10, 2006 to continue the presentation.

18. The ASSAP MOPS telecon, on 27 July 2006, ended at 3:00 PM (Eastern Time).